APPENDIX D:
Water System Input and Output

APPENDIX D -- INTRODUCTION

Appendix D provides a summary of output data generated by the water system model for all the alternatives. The figures and charts in the appendices use the alphanumeric codes specified below to identify the ten (10) modeled runs that represent the four alternatives. The use of these codes helped the compilation and organization of model input and output data:

1a New 80 cfs pump on the Okanogan River, steelhead only, channel rehabilitation
1b New 80 cfs pump on the Okanogan River, steelhead and Chinook, channel rehabilitation
1c New 80 cfs pump on the Okanogan River, steelhead only, no channel rehabilitation

2a Upgrade Shellrock to 35 cfs, steelhead only, channel rehabilitation
2b Upgrade Shellrock to 35 cfs, steelhead and Chinook, channel rehabilitation
2c Upgrade Shellrock to 35 cfs, steelhead only, no channel rehabilitation

3a 5100 AF water rights purchase, steelhead only, channel rehabilitation
3b 5100 AF water rights purchase, steelhead and Chinook, channel rehabilitation
3c 5100 AF water rights purchase, steelhead only, no channel rehabilitation

4 No Action Alternative

Please note, the model runs presented in this Appendix include more combinations than were carried forward for EIS analysis in the current group of EIS alternatives. For example, each of the water supply action alternatives was modeled both with and without stream rehabilitation. Each water supply alternative was also modeled to supply the flow regime for steelhead only and steelhead with chinook (See Table 3-21).

Appendix D is organized as follows:

D-1. Summary of Model Input and Output Data for All Alternatives and Flow Scenarios

D-2. Monthly Water Level Elevation Exceedance Graphs for Conconully and Salmon Lakes for All Alternatives and Flow Scenarios

There are 20 charts in this appendix, 10 for each lake representing the 10 model runs. The charts are presented as pairs (for Conconully and Salmon Lakes) in the order of the alphanumeric codes listed above.

D-3. Monthly Streamflow Exceedance Graphs for four locations along Salmon Creek for All Alternatives and Flow Scenarios

There are 40 charts in this appendix. The four locations are listed in order for each of the 10 model runs. Salmon Creek above the weir (bottom of Middle Reach), Salmon Creek below the weir (top of lower reach), Salmon Creek at the mouth, and Conconully Spill.

The graphed exceedence values for the middle reach of 0.5 cfs in the month of April under the No Action Alternative do not accurately represent the true flow in this reach for the month. Because of how the model accounts for estimated seepage in the middle reach and handles the first month of irrigation demand, it indicates a very low streamflow, when in reality there is likely up to approximately 15 cfs in the channel.

D-4. Comparative Graphs of Simulated Monthly Lake Elevation Data

There are 18 charts in this appendix. The first nine compare the three flow scenarios of the three alternatives (3 x 3) to the No Action Alternative for Salmon Lake. The second nine show the same comparisons for Conconully Lake. Each set of three graphs shows the comparisons for the i) minimum, ii) median, iii) 10%, and maximum lake elevations.

D-5. Comparative Graphs of Simulated Monthly Streamflow Data for Salmon Creek

There are 30 charts in this appendix. The charts are in four groups representing the following four locations along Salmon Creek: i) Conconully Reservoir Spill, ii) the downstream end of the Middle Reach above the weir at the OID diversion, iii) the upstream end of the Lower Reach below the weir at the OID diversion, and iv) the downstream end of the Lower Reach at the mouth. Within each group are nine charts (only three for the Conconully Reservoir Spill group) that compare Alternative 4 (No Action) to the high, median and minimum monthly streamflows for Alternatives 1, 2 and 3.

The graphed exceedence values for the middle reach of 0.5 cfs in the month of April under the No Action Alternative do not accurately represent the true flow in this reach for the month. Because of how the model accounts for estimated seepage in the middle reach and handles the first month of irrigation demand, it indicates a very low streamflow, when in reality there is likely up to approximately 15 cfs in the channel.

D-6. Summary Table of Simulated Effects of Salmon Creek Flows on Okanogan River Flows per Water Year Type for All Alternatives

The table lists by row five water year types for the four alternatives streamflow-related data used to quantify the impact of Salmon Creek flows on Okanogan River flows.

D-7. Summary of Simulated Annual Totals or Annual Averages for OID Irrigation Delivery Data

There are 10 tables in this appendix. Each table summarizes the 99-year record (and average, maximum and minimum) of simulated annual totals for OID irrigation delivery data for the 10 model runs that include the No Action Alternative and the three flow scenarios for the 3 alternatives (or 3 x 3 tables). The data are in acre-feet and consist of Salmon Creek Diversion, Canal Seepage, Canal Spill, Pumpage from Duck Lake, Pumpage from Okanogan (either Shellrock or the new 80 cfs pump), Critical Period Shortage, Total Irrigation Delivery, and the Total Demand from the System. Also provided are the calculated Delivery Efficiencies, and the Maximum and Minimum On-farm Efficiencies.